

REMARKS

At the time of the Office Action dated July 19, 2010, claims 35-51 were pending in this application. Of those claims, claims 37-51 have been withdrawn from consideration pursuant to the provisions of 37 C.F.R. §1.142(b).

In this Amendment, claims 35 and 36 have been amended and new claims 52-55 added. The specification has also been amended. Care has been exercised to avoid the introduction of new matter. Support for the amendments to the claims and the addition of the new claims will be discussed below.

Claims 35, 36, and 52-55 are now active in this application, of which claims 35 and 52 are independent.

Descriptive Support for Claims

Claim 35

Support for the limitations “a heat medium path is disposed on at least one of the second surface of the first plate and the fourth surface of the second plate” can be found on, for example, page 16, lines 11-17 of the original specification describing:

In this embodiment, the cooling water is used as a heat medium for preventing the dew condensation in the fuel gas. However, the oxidant gas can be used for a heat medium instead of the cooling water. In this case, the gas inlet header for the oxidant gas is disposed close to the gas outlet header 4 for the fuel gas in the plate 1 on the other side, although the arrangement is not shown, and water channels for supplying the cooling water are disposed in the other plate.

The above limitations can also be supported on, for example, page 20, lines 21-27 of the original specification describing:

In the second embodiment, the cooling water is also used as a heat medium for preventing the dew condensation of the fuel gas. However, the oxidant gas can be used as a heat medium instead of the cooling water. In this case, the gas inlet

header for the oxidant gas is disposed close to the gas outlet header 4 for the fuel gas in the plate 1 on the other side, although the arrangement is not shown, and water channels for supplying the cooling water are disposed in the other plate.

Support for the limitations “by disposing the fuel gas inlet header to be back to back with the heat medium inlet header or the heat medium outlet header” can be found on, for example, page 13, lines 26 to page 14, line 1 of the original specification describing that “a water inlet header in the concave form, which is disposed on the other surface of the plate 1” and page 21, lines 5-7 describing that “However, it is possible to employ the structural arrangement in which the reaction gas and the cooling water flow in the direction anti-parallel to each other.” Support for the limitations can also be found on page 20, lines 1-6 of the specification which describes as follows:

In the second embodiment, the water inlet header is disposed such that it is close to the gas inlet header 4 on the other side, so that the water inlet header is heated by the cooling water supplied thereto, and the gas inlet header 4 is indirectly heated by the heat conduction, thereby making it possible to prevent the water vapor contained in the fuel gas from condensing.

Claims 52

Support for the limitations “a heat medium path is disposed on the second surface of the first plate and the fourth surface of the second plate” can be found on, for example, page 16, lines 11-17 of the original specification describing as follows:

In this embodiment, the cooling water is used as a heat medium for preventing the dew condensation in the fuel gas. However, the oxidant gas can be used for a heat medium instead of the cooling water. In this case, the gas inlet header for the oxidant gas is disposed close to the gas outlet header 4 for the fuel gas in the plate 1 on the other side, although the arrangement is not shown, and water channels for supplying the cooling water are disposed in the other plate.

Support for the above limitations can also be found on page 20, lines 21-27 of the original specification as follows:

In the second embodiment, the cooling water is also used as a heat medium for preventing the dew condensation of the fuel gas. However, the oxidant gas can be

used as a heat medium instead of the cooling water. In this case, the gas inlet header for the oxidant gas is disposed close to the gas outlet header 4 for the fuel gas in the plate 1 on the other side, although the arrangement is not shown, and water channels for supplying the cooling water are disposed in the other plate.

Support for the limitations “condensation of water vapor contained in the oxidant gas is prevented, in normal operation, by heating the oxidant gas inlet header with the heat medium” can be found on, for example, page 33, lines 7-10 of the original specification describing as follows:

Setting the temperature of the reaction gas less than temperature of the heat medium causes the reaction gas to be heated up in the inlet area by the heat medium, thereby making it possible to prevent the water vapor in the wet reaction from dew condensation in the inlet area.

Support for the limitations “by disposing the oxidant gas inlet header to be back to back with the heat medium inlet header or the heat medium outlet header” can be found on, for example, page 28, line 26 to page 29, line 1 of the original specification describing that “[t]he cathode cooling plate 23 is positioned such that the side on which the oxidant gas channels 23b are not formed faces the side of the heat medium channels 22b in the anode cooling plate 22, ” and page 29, lines 14-16 of the original specification describing that “[t]hus, the fuel cell stack can also be constituted exclusively by the combination of an anode cooling plate and a cathode cooling plate without any bipolar plate.”

Further, Fig. 6 shows disposing the oxidant gas inlet header 23h which is shown in Fig. 9(a) to be back to back with the heat medium inlet header 22h (Fig. 8(b)) or the heat medium outlet header 22i (Fig. 8 (b)). Because Fig. 6 shows that the oxidant gas inlet header (23h) is disposed on a second surface (a right surface) of a second plate (the cathode cooling plate 23) and shows that both the heat medium inlet header (22h) and the heat medium outlet header (22i)

are disposed on a fourth surface (a left surface) of the second plate (cathode cooling plate 23). A anode cooling plate 22 shown in Fig. 6 may correspond to a first plate.

Claims 53

Support for the limitations “condensation of water vapor contained in the oxidant gas is prevented, in normal operation, by heating the oxidant gas inlet header with the heat medium by disposing the oxidant gas inlet header to be back to back with the heat medium inlet header or the heat medium outlet header” can be found in the original specification describing, for example, as follows:

Setting the temperature of the reaction gas less than temperature of the heat medium causes the reaction gas to be heated up in the inlet area by the heat medium, thereby making it possible to prevent the water vapor in the wet reaction from dew condensation in the inlet area. Page 33, lines 7-10 of the original specification.

[A] water inlet header in the concave form, which is disposed on the other surface of the plate 1. Page 13, lines 26 to page 14, line 1 of the original specification.

In the second embodiment, the water inlet header is disposed such that it is close to the gas inlet header 4 on the other side, so that the water inlet header is heated by the cooling water supplied thereto, and the gas inlet header 4 is indirectly heated by the heat conduction, thereby making it possible to prevent the water vapor contained in the fuel gas from condensing. Page 20, lines 1-6 of the original specification.

However, it is possible to employ the structural arrangement in which the reaction gas and the cooling water flow in the direction anti-parallel to each other. Page 21, lines 5-7 of the original specification.

Claims 54 and 55

Support for the limitations “the oxidant gas inlet header is maintained in normal operation at a temperature of the dew point of the oxidant gas or higher by heat transfer from the heat medium” can be found on, for example, page 16, lines 7-10 of the original specification describing that “it is preferable that the temperature of the oxidant gas (air) is set so as to fulfill

the following relationship” and “[t]he dew point of the fuel gas \leq the dew point of the air \leq the temperature of the cooling water at the inlet.”

Substitute Specification

In response to the Examiner’s request, a Substitute Specification is submitted concurrently with this Amendment. Applicants note that the Substitute Specification includes the current amendments to the specification (which are underlined in the marked-up version of the Substitute Specification) and the amendments previously made to the specification (which are not underlined).

Drawings

The drawings have been objected to because according to the Examiner, they do not depict at least one of the fuel gas inlet header and the oxidant gas inlet header to face the heat medium inlet header or the heat medium outlet header, as recited in claim 35.

The limitations identified by the Examiner have been deleted from claim 35. Accordingly, Applicants respectfully solicit withdrawal of the objection to the drawings.

Claim Rejection under 35 U.S.C. § 112

Claims 35 and 36 have been rejected under 35 U.S.C. §112, first paragraph, because according to the Examiner, “the specification, while being enabling for the heat medium pass being formed on the second surface of the first plate of the first unit cell, does not reasonably provide enablement for the heat medium pass located between the second surface of the first

plate of the first unit cell and the fourth surface of the second plate of the second unit cell”
(paragraph 4 of the Office Action).

Claim 35 has been amended to delete the limitations “between the second surface of the first plate of the first unit cell and the fourth surface of the second plate of the second unit cell,” and delete the limitations “(1) to face the heat medium inlet header or the heat medium outlet header.” As discussed above, claim 35 has support in the original specification.

Based on the above, Applicants believe that the specification describes how to make and use the claimed subject matter with sufficient clarity, precision and detail to enable persons skilled in the art to make and use it without undue experimentation. Withdrawal of the rejection of claims 35 and 36 under 35 U.S.C. § 112, first paragraph is therefore respectfully solicited.

New Claims 52-55

New claims 52-55 are explicitly supported in, for example, the original specification as discussed above. Favorable consideration is respectfully solicited.

Conclusion

In view of the above amendments and remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

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including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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